Growth impact of major sporting events

Sterken, E.

Published in:
European Sport Management Quarterly

DOI:
10.1080/16184740601154516

Publication date:
2006

European Sport Management Quarterly

ISSN: 1618-4742 (Print) 1746-031X (Online) Journal homepage: https://www.tandfonline.com/loi/resm20

Growth Impact of Major Sporting Events

Elmer Sterken

To cite this article: Elmer Sterken (2006) Growth Impact of Major Sporting Events, European Sport Management Quarterly, 6:4, 375-389, DOI: 10.1080/16184740601154516

To link to this article: https://doi.org/10.1080/16184740601154516

European Sport Management Quarterly,
Vol. 6, No. 4, 375–389, December 2006

Routledge
Taylor & Francis Group

ARTICLE

Growth Impact of Major Sporting Events

ELMER STERKEN

University of Groningen, the Netherlands

ABSTRACT In this paper we analyse the impact of organizing major sporting events on economic growth. We present *ex-post*-cross-country event results for the Summer Olympic Games and the FIFA World Cup. Both descriptive statistics of the relation between the timing of events and economic growth and estimation results of a panel growth model that incorporates both regular growth determinants and the timing of major sports events are presented. We observe that the Summer Olympic Games stimulate per capita GDP (gross domestic product)-growth, while the FIFA World Cup does not.

In this paper we analyse the economic impact of organizing the Summer Olympic Games and the FIFA Football World Cup (World Cup in brief hereafter). These two events are the largest sporting events in the world (measured by attendance and financing needs) and have a strong international following in terms of (pre-)competition and participation. Although the Olympic Summer Games is characterized by a large variety of sports, while the World Cup involves only football, both events attract huge media attention rates and require substantial budgets. One major issue for hosting cities (and so national authorities) is whether significant additional economic growth effects can be derived from efficient organization. In the literature so far no systematic evidence of multiple events across different countries has been presented, but in this paper a first attempt is made.

Economic analyses show mixed evidence as to whether organizing large sporting events contributes to economic growth. There is a lively debate on the size and direction of impact on the development of local economic activity (i.e. within cities or counties). Local organizers tend to produce optimistic *ex-ante* forecasts, using cost–benefit analyses based on, for example, input-output or computable general equilibrium models, and

Correspondence Address: Elmer Sterken, Department of Economics, University of Groningen, PO Box 9700 AV Groningen, the Netherlands. Email: e.sterken@rug.nl

ISSN 1618-4742 Print/ISSN 1746-031X Online
DOI: 10.1080/16184740601154516

predict a serious growth impact. *Ex-post* analyses, measuring observed changes in factors such as (local) income and attributing these changes to the impact of hosting a sporting event are, on average, more modest. There are various explanations of the different findings between *ex-ante* and *ex-post* studies (see, e.g., Baade & Matheson, 2004a). First is the crowding out argument: in *ex-ante* analyses often the gross result is confused with net impact. Second, the precise impact of the so-called income multiplier might be wrongly estimated. Moreover, analyses based on surveys of inhabitants of cities or regions can be affected by selection bias: opinions of those who do not respond are as important to the final result as the opinions of those who do respond.

In this paper we contribute to the debate on the impact of major sporting events by presenting *ex-post* evidence. Our main contribution is that we pursue the analysis on major sporting events on a national instead of a regional level. We consider the two largest sporting events, the Summer Olympic Games and the World Cup and analyse their impact on national economic development. Thus we do not focus on national sporting events, such as the Super Bowl or the Oxford–Cambridge Boat Race, or on other large international events, such as the UEFA Champions League Final, the IAAF World Championships in Athletics, the Winter Olympic Games or the UEFA European Cup Football (see, e.g., Oldenboom (2006) for an analysis of the Euro Cup 2000 in Belgium and the Netherlands). The latter international events have recently attracted substantial attention, but are still far smaller than the Summer Olympic Games and World Cup in terms of media exposure, costs and revenues. Moreover, the Winter Olympic Games and UEFA Cup attract a smaller number of countries in participation (both in the event and in pre-competition) than the Summer Olympic Games and World Cup. Local single- or multiple-day events also are smaller in financial size than the two major sporting events we consider.

The interest in the macroeconomic impact of organizing events such as the Olympic Summer Games and the World Cup has increased as bidding cities want to present a balanced view of their expected costs and benefits. Organizing major sporting events such as these requires approximately 10 to 20 billion US dollars (of which the operating costs are only a fraction and investment costs have increased substantially over the years). Both public (national and local governments and, e.g., the IOC or FIFA) and private sources of finance (sponsors) are used as financiers. The share of broadcasting and sponsorship revenues in financing the events has increased over the years (see Preuss, 2004, for evidence on the Olympic Summer Games), while ticketing revenues have decreased in relative importance. Given the enormous financial burden of organizing major sporting events, a positive macroeconomic impact is of course advantageous (if positive) to local bidding organizations.

The impact of organizing major sporting events on local economic activity is a topic of significant debate. Arguments relating to both supply (via investment in infrastructure, telecommunications, labour productivity, and urban development) and demand (increase in tourism, consumer confidence,

local availability of jobs) contribute to explaining changes in (local) growth rates. However, demand effects might lead to crowding out, even at the regional level and certainly at the national level. Establishing supply effects is most likely to be affected by the omitted variable problem. Even on the regional/city level there is a serious debate about the evidence of the economic impact of organizing sporting events. In the following section we present a short review of this literature and focus on the distinction between *ex-ante* and *ex-post* analyses. Next we present an overall combined cross-section time-series approach to analyse the macroeconomic impact of major events. We use data over both the full history of the Modern Olympic Summer Games and the World Cup in a descriptive setting and in a model of the post-war sample, in most cases from 1960 onwards, to establish the impact of major sporting events on (per capita) GDP (gross domestic product)-growth rates. We present the descriptive analysis in the third section and an economic panel growth model in the fourth section. The fifth section presents a summary and conclusions.

Modelling the Impact of Major Sporting Events

There are two types of economic analyses to establish the impact of organizing major sporting events on (local) economic development. First, one can predict the expected impact using an *ex-ante* analysis. Most organizing committees produce such forecasts. As with any other economic forecasting experiment, various types of error can cause forecasts to differ from outcomes. First, there might be model uncertainty. In the analysis of the economic impact of large sporting events, input–output or computable general equilibrium models are popular tools to integrate economic impact analysis into a cost–benefit setting, but all types of models have their analytical strengths and weaknesses. Besides the functional form of the model, model parameters might also be subject to uncertainty. If model parameters are, for instance, not invariant to large shocks, such as the organization of a major sporting event, predictions based on historical parameters may lead to erroneous conclusions. Next there is uncertainty in model variables. Forecasting requires the input of expected time paths of the exogenous variables, which might not materialize in practice. Moreover, some relevant variables might not be included in the model. Third, related to variability of model parameters, economic agents might change their behaviour due to the shock of occurrence of the event. This implies that the proposed model is not capable of estimating the behavioural consequences due to dependence on policy.

The second type of analysis is *ex post*, establishing the contribution of the organization of large sporting events to economic development. This type of *ex-post* analysis is not subject to uncertainty in the development of exogenous model variables, or unforeseen changes in behaviour, but is still dependent on the choice of the (conditioning) model. Take, for example, a simple econometric model that models economic growth as a function of ′normal′ economic growth determinants and an indicator of the sporting

event. First, there might be an omitted variable problem in the set of growth determinants. Next, endogeneity of both the growth determinants and the organization of the event might blur the results. An example would be that a local organization committee of the World Cup which selects a city to host matches that is expected to have a prosperous future. If local growth materializes it may be due to the projected prosperity of the city rather than the hosting of games. So, even if models seek to control for the above mentioned crowding out and biased estimation of the multipliers (if relevant), there may still be differences between *ex-ante* and *ex-post* studies. Finally, there may be political factors at play: local organizers sometimes only publish or use optimistic analyses.

There is a large literature on both *ex-ante* and *ex-post* studies of the economic impact of sporting events. Many studies of the Summer Olympic Games are present in the *ex-ante* class (see Preuss, 2004, p. 45 for a review). As Preuss illustrates for the Summer Olympic Games, there is empirical evidence on the estimated economic impact since the Munich 1972 Games (see, e.g., studies such as Humphreys & Plummer (1995) for the Atlanta 1996 Games, Andersen (1999) for the Sydney 2000 Olympics, and Papanikos (1999) for the Athens 2004 Games). *Ex-ante* studies for the World Cup have been carried out as well such as by; Goodman & Stern (1994) for the US edition of the World Cup in 1994 and Ahlert (2001) and Rahmann & Kurscheidt (2002) for the World Cup in Germany in 2006.

Next there are *ex-post* studies of the organization of sporting events. Examples for the World Cup are Baade & Matheson (2004a) for the US 1994 World Cup and Kim *et al.* (2006) for the World Cup 2002 in Korea. For the Olympic Games, Baade &Matheson (2002) propose a methodology to assess the economic impact on the city level and Hotchkiss *et al.* (2003) give an analysis of local employment and wage changes during the 1996 Atlanta Summer Games. There are several other *ex- post* studies of the impact of organizing local sporting events, such as the Super Bowl (see Porter, 1999; Baade & Matheson, 2000, 2004b; Matheson, 2005), the Major League Baseball All-Star Game (Baade & Matheson, 2001), post-season American professional sports (Siegfried & Zimbalist, 2000; Coates & Humphreys, 2002) on the economic development of the host city. The studies on the Super Bowl event are examples of the debate on the magnitude of the local economic impact of the organization of this event in the US and demonstrate a large range of possible outcomes. The *ex-post* studies on average are modest with respect to the conclusion whether the organization of the sporting events contributes to per capita income of the inhabitants of the host city.

In this study we combine sporting event data in a time frame and so lump together different national institutions. Such a multi-country approach has pros and cons. The most important disadvantage is probably that we consider heterogeneous events. Each event tells a different story and averaging out probably destroys valuable information. On the other hand, a cross-section study delivers systematic ‘‘evidence’’ at the macroeconomic level. Since event-specific circumstances are so crucial to the outcome of the

analysis, individual results are probably less relevant to future decisions, while a cross-event study does contribute to supplying such information. *Ex-post*-cross-event analysis of course crucially depends on appropriate conditioning of economic results for "normal" economic development.

Organizing a major sporting event like the Olympic Summer Games or the World Cup is believed to have a national economic impact. Below we briefly review the likely transmission channels of a sports shock (see, e.g., Price Waterhouse Coopers, 2004, or Preuss 2004, for detailed discussions). We shortly review the channels of transmission from organizing a large sporting event on economic conditions. We classify the channels according to the following characteristics:

1. What are the *ex-ante*, during, and *ex-post* channels of influence?
2. Which mechanisms affect technology (e.g. the capital stock, use of labour and technological progress) or preferences (by home and foreign agents (tourism) in terms of supply of labour and consumption behaviour) or both?
3. What are the complex social interactions which result from success, over-optimism and other behavioural channels?

Empirical evidence discussed above suggests that the overall economic impact of large-scale events is difficult to evaluate due to the multiple channels at work. Note that, on the world level, there will be no impact of organizing local sporting events. So we consider local shifts of economic activity at best. Since we do not link the "shocks" of organizing major sporting events to deep structural technology or preference descriptions, and we do not stress behavioural elements in great detail, we focus on the timing of the impact. Concerning the timing, we can observe the following alleged benefits:

- It is likely that *ex-ante* investment will increase. In most cases new sporting facilities and infrastructure need to be constructed. This holds to a larger extent for the Summer Olympic Games than for the World Cup, because the Summer Olympics include many different sporting events and require more non-sporting infrastructure. It seems to matter whether investment is private or public, what the expected returns in general will be (probably dependent on the type of investment), and how investment can be financed (by issuing bonds, using retained private earnings, equity issues, etc.). Siegfried & Zimbalist (2000) doubt the economic impact of investment in infrastructural facilities such as stadiums. Well-known debates in this class are of the following nature: in bidding for the Olympic Games one can question the need for new buildings and roads (especially their return after the end of the Games) knowing that both the private and public sector were unwilling to invest without organizing the Games; sometimes, the organization of a large event is simply a short-run reduction of the uncertainty premium on waiting to invest; in addition tourism will increase: people are curious to see the new stadium, etc.

- Consumer expenditure will increase during the event. Tourism will boost expenditure. Depending on local wage flexibility, mark-ups will increase, employment will boom and local profits will increase. Probably consumer confidence will be boosted, especially if the national team(s) or sportsmen perform well (see Ashton *et al.*, 2003) for an example of the relation between sports success and the stock exchange). Local receipts (e.g. ticketing) and other sources of revenues will have at least a short-run multiplier impact on the local economy.
- After the major event has come to an end, the local economy can benefit from the (temporary) demand shock and the increased quality of infrastructure. Probably reputation also plays a role: the name of the city can, for example, turn into a brand name. Human capital can probably be increased in quality, and urban regeneration might increase the tourist value of the organizing cities.

On the cost side we should keep in mind the opportunity costs: the same money could have been spent on other things. *Ex-ante*, investment costs and so-called preparatory costs (say the costs of bidding) will be important. During the event there are operational costs, such as the costs to keep the event safe, and after the event maintenance costs might come to the fore. In all three instances the various arguments might apply differently to the various cities or nations.

From a macroeconomic theory perspective one could expect the investment in infrastructure and human capital to have permanent effects on economic growth. For some cases this evidence seems to hold. Famous examples are the economic development of Seoul after 1988 and Barcelona after 1992. These cities seem to have benefited from better infrastructure and telecommunications, as well as city renovation, to a large extent. However, these effects seem to be local and cannot be observed at the national level. Temporary increases in demand via tourism seem to be influential in explaining demand shocks, which typically have shorter horizon propagation functions. Tourism may be boosted during the event. At the 2002 World Cup more than 1 million tourists visited Korea. On the other hand congestion forecasts might force non-sports tourists to postpone their visit (this is known to have been the case for Athens 2004). The revenues from operations have a modest impact, since a large fraction of the receipts goes to international and foreign organizations.

The impact of over-optimism on factors such as consumer spending is another channel of a demand effect. This effect is really temporary. Investigating indexes of OECD consumer confidence for Italy 1990, Barcelona 1992, France 1998 and Athens 2004 reveals that only in the French case was consumer confidence boosted. As Falter *et al.* (2005) show, this had an impact on the demand for football (in terms of demand for tickets for the national league after 1998). However, for the other cases there is no clear behavioral change in consumer behaviour.

Descriptive Economic Growth Statistics

In order to get a first impression of the macroeconomic impact of organizing major sporting events such as the Summer Olympic Games and World Cup we compute over time the GDP growth rates of the organizing countries. For this element we used an historical GDP data set developed by Maddison (2003). For major economies we have GDP-data from 1870 onwards (including data for the Soviet Union). From this set we computed a weighted average world growth rate and denoted this average rate as world GDP growth. Next we corrected national growth rates for the world GDP growth rate (by deduction) and use a 15-year window of the median excess growth rates of the organizing countries to analyse the relation between the major sporting event and economic growth. So our cases consisted of 15 observations $(t-7,\ldots,t,\ldots,t+7)$ of excess growth rates of real GDP of the organizing country per event. We make a distinction between the Olympic Games and the World Cup in Table 1. For the Olympic Games we started the sample in 1900 (the Paris edition); for the World Cup we started with the Italian edition of 1934. We stopped at the Athens 2004 edition for the Olympic Games and the 2002 Korea/Japan edition of the World Cup (otherwise we would have had too few observations on future data). We split data for the Olympic Games into three categories, editions before 1956, the editions between 1956 and 1984, and the more recent ones (after 1984). For the World Cup we divided the sample into three editions before 1954, between 1954 and 1978 and the editions after 1978. Note that for the results with respect to the Olympic Games the editions in Japan 1964 and Korea 1988 increase the mean and median growth rates in the sub-sample after 1956. The general pattern remains the same however: the countries hosting the Olympic Games seem to have higher GDP growth rates than the World Cup hosts.

The table shows two principal findings. Note that the figures are in percentage-point deviations from the median growth rate (we take the median instead of the mean to account for skewness of the distributions). The first finding is that if there is any impact of any event on macroeconomic growth in this simple setting, it is insignificant. The second finding is that standard deviations of the median excess growth rates are about 1.5 to 2% GDP-growth. This finding illustrates that we need to explain economic growth better in order to understand the impact of major sporting events. This is the goal of the analysis in the next section, where we estimate a growth model including organizing major sporting events dummy variables. The variance of the excess GDP-growth of the old editions of the Olympic Games and the World Cup is by far larger, but the overall impact is modest due to the size and technology of the events in those years. Second, the impact of the Olympic Games exceeds the impact of the World Cup. Over the 15-year window the excess median GDP growth rate of those countries that organized the Olympic Games is about one percentage point higher than the corresponding values for the countries staging the World Cup. For the Olympic Games we clearly see the investment effect prior to the event, and

Table 1. Median Excess Real GDP Growth Rates

Period	Olympic Games	Before 1956	1956–1984	After 1984	World Cup	Before 1954	1954–1978	After 1978
$t-7$	0.631	−0.935	1.284	−0.682	−0.747	−2.758	0.184	−0.538
$t-6$	−0.350	−0.528	0.341	−0.492	−1.208	1.061	−1.666	−1.208
$t-5$	−0.667	−3.176	−0.614	−0.256	−0.137	4.729	−0.137	−0.966
$t-4$	0.214	1.030	0.054	0.144	−1.978	−1.978	−0.479	−2.002
$t-3$	0.942	0.401	0.942	1.241	−2.007	−0.484	−1.166	−2.352
$t-2$	0.521	−0.035	0.955	1.345	−0.934	1.396	−0.958	−0.934
$t-1$	0.600	0.016	0.809	0.644	−0.412	1.111	0.003	−1.125
t	−0.759	−1.593	1.101	−1.077	−0.728	−0.831	−2.109	−0.159
$t+1$	−0.627	−1.970	−0.606	−0.323	−0.813	0.613	0.000	−1.535
$t+2$	1.405	2.722	1.038	1.010	−1.048	−7.256	0.609	−1.298
$t+3$	−0.504	−1.139	0.108	−0.314	−0.659	−0.041	−1.368	−0.659
$t+4$	−1.208	−1.763	−0.499	−1.563	−0.497	0.271	−1.328	−0.492
$t+5$	−0.896	−0.924	−1.025	−0.867	0.727	0.727	0.415	0.744
$t+6$	−0.648	−1.194	−0.152	1.374	−1.548	−3.318	−0.964	−1.548
$t+7$	0.147	−0.418	0.254	0.544	−1.818	4.636	−1.714	−2.336

Note: The figures are in percentage-points deviations from the world real GDP growth average. Source of the data: Maddison (2003). The first editions included are the 1900 Paris edition of the Olympic Games and the 1934 Italy edition of the World Cup. The last edition of the Olympic Games included is Athens 2004, while for the World Cup Japan/Korea 2002 is the last event.

to a lesser extent the legacy effect after the games. However, the basic findings of Table 1 are purely descriptive and should be complemented by a growth analysis. The growth analysis can increase the probability of finding statistically significant results by conditioning economic growth for its standard determinants.

A Simple Growth Model Including the Timing of Major Sporting Events

In the previous section we explored economic growth of the countries organizing the two major sporting events, the Summer Olympic Games and the World Cup. There is weak (insignificant) evidence that the organizers of the Summer Olympic Games have rather prosperous rates of economic growth, while this is not true for the World Cup. There can be two objections to these descriptive observations. First, one should correct growth rates for the "normal" growth rates of the economies involved. Second, it could be that the International Olympic Committee (IOC) has simply selected higher growth-potential countries to organize the Summer Olympic Games than the FIFA did for the World Cup. Indeed this might be a problem for the Summer Olympic Games. The IOC uses the ability of future organizers to build the appropriate accommodation as one of its decision-making criteria. This implies that expected economic growth indeed might be relevant to the choice of the host country. Up until 1994 FIFA selected in turn a European country and a Latin-American country to host the tournament four years later. This reduces the selection bias for the World Cup to some extent. After 1994 FIFA adopted has a global policy of selecting a country from each continent in succession, so that development of football as a sport dominates the decision. In order to test this selection bias hypothesis we estimated a binary choice (logit) model with the event dummy variables as dependent variables (taking the value 1 if a country organized an event and 0 in other cases) and lagged GDP per capita growth as determinants. There is no endogeneity of the events found for lags up to eight years.

In order to solve the first problem we needed to condition the correlations for other determinants of economic growth. We included the organization of major sporting events in a simple empirical growth model. Since the work of Barro & Lee (1994) and Barro & Sala-I-Martin (1998), economic growth models have been tested extensively. The main debate in this class of models concentrates on the selection of growth determinants and the modelling of convergence. We do not want to contribute to this discussion and merely use the framework of economic growth models to explore conditioned correlations between economic growth and major sporting events dummy variables. Economic growth models have the form:

$$\Delta y_{it} = \alpha\, y_{it,.base} + \beta\, X_{it} + \gamma_i + \delta_t + \varepsilon_{it} \qquad (1)$$

where y_{it} represents the log of GDP per capita in country i in year t, $y_{it.base}$ is the log of GDP per capita in a fixed base year (but which is included for each estimation period to control for the impact of differences in growth rates at

the beginning of the sample), X_{it} a set of determinants (including for instance dummy variables indicating the organization of a sporting event), γ_i country specific effects, δ_t time specific effects and ε_{it} residuals. The time specific effects can be interpreted as average world economic growth (and other possible universal trends). The inclusion of these fixed coefficients therefore makes the results of the growth model comparable to the descriptive exercise in the previous section, where we corrected growth rates for the world average. The theory of convergence concentrates on α, which relates per capita growth rate of GDP with the level of GDP per capita in the base year. Countries with a relatively low GDP per capita have more growth potential. The discussion on the empirical growth models centres on the selection of the determinants, the specification of the time intervals (such as the use of annual data, five-year averages, or even longer time spans), and the way to estimate the models. Concerning the selection of growth determinants, the most likely candidates are indicators of investment in physical and human capital. The latter variables are typically hard to measure at a high frequency, as in our case, which renders them useless in an annual event-window analysis. Besides investment indicators, indicators of openness of the economy are often found to be relevant. There is also evidence that monetary conditions affect economic growth. In our model we include, therefore, gross fixed capital formation, trade as a percentage of GDP, and the inflation rate as growth determinants. Note that we are not so much interested in the individual contribution of these normal growth determinants (and so collinearity between the standard growth determinants is uninteresting as long as they do not correlate with the event dummy variables), but merely concentrate on the variables that indicate the organization of a major sporting event.

We estimate a pooled time series cross-section model (1) and include dummy variables for the large events for a four-year window (we use 4 instead of 7 lags and leads due to the number of observations available). We test for the suitability of a fixed versus random effects specification of the model and find that fixed effects cannot be rejected. We used data from the World Development Indicators from the World Bank. This set is available for 208 countries from 1960 onwards, and allows us to get consistent data on GDP per capita, gross fixed capital formation, and trade data (the Maddison (2003) data set only includes GDP data, but for a longer time span). We have reduced the set of 208 countries to 96 countries that have actively participated in both the Summer Olympic Games and the World Cup. This means that we have included countries that have never organized one of the two major sporting events, but could be potential candidates for hosting (the main assumption being that participation signals the desire to organize). This extends the descriptive statistics in the previous section, where we only included observations on countries which had organized one of the two events. Our dependent variable is the first difference of the log of real GDP per capita. Note that this is slightly different to the real GDP-growth rate data used in the third section. However, the main variation originates from fluctuations in real GDP and not in population. In growth

models it is common to use the growth rate of real GDP per capita as dependent variable. We included the 1960 level of real GDP per capita (in 1995 US dollars) $\log(GDP_{60})$, the growth rate of the gross real fixed capital formation as a percentage of real GDP $\Delta\log(GFC)$, the log of the trade share of GDP $\log(TRA)$, and the inflation rate *INF* as base determinants. Next we included dummy variables, denoted by $t+i$, where i runs from -4 to 4, to denote the organization of major sporting events and use a four-year window. Table 2 presents the major findings. We show that adding the event dummy variables improves the fit of the model (as one can see from the reduction of the sum of squared residuals *SSR*). The signs of the determinants are as expected: gross fixed capital formation contributes to economic growth, as does trade openness, while inflation has a negative impact. The insignificant parameter estimates of $\log(GDP_{60})$ denotes that we do not find evidence of convergence.

Table 2 includes results for a base model without event dummy variables, a column for the Summer Olympic Games and one for the World Cup. It shows some remarkable results. First, the values of the dummy variable parameters are relatively large in some cases, up to 2.5 percentage-points in the current year. This suggests that the per capita growth rates around the date of organizing major sporting events have varied substantially from a normal growth rate. Given some of the cautions of estimating growth models to be discussed hereafter, the absolute figures should be interpreted with care. The high growth differentials could be due to selection bias. Take, for instance, the case of Japan 1964 or Korea 1988: both economies were booming in the years around their event dates, which effect is not fully controlled for by including the 1960 per capita GDP level (Japanese and Korean values were rather low then) or the other three determinants. Second, the difference between the Summer Olympic Games and the World Cup is remarkable. We find very positive additional real growth rates for the impact of organizing the Summer Olympic Games, but no or negative effects for the World Cup.

A few words of caution should be made in interpreting the estimation results. First, the growth model might not be conditioned properly: relevant variables explaining economic growth of the 96 economies might still be omitted. In addition, some of the growth determinants might be endogenous, which would require other econometric techniques (e.g. using instrumental variables). There might also be a selection bias in our set of 96 countries, as we exclude countries that did not participate in both events in the past. A final point of critique on the growth model could be that the event dummy variables are endogenous. As noted before the cities or countries selected are known about seven years in advance in our sample, though our test results indicate exogeneity.

As in Table 1, with descriptive statistics we performed estimation in the corresponding sub-samples (1964–1980 and 1984–1998 for the Olympic Games, and 1964–1978 and 1982–1998 for the World Cup) as a robustness check of our main findings in Table 2. The results are in Table 3. Table 3 shows that the general conclusions of Table 2 still hold. If anything, the

Table 2. Pooled Estimation Results: Real GDP Per Capita Growth

Variable	Base model	Olympic Games	World Cup
$\log(GDP_{60})$	−0.186	−0.181	−0.192
	(−1.168)	(−1.126)	(−1.200)
Δ ($\log(GFC)$)	6.052*	6.043*	6.039*
	(6.315)	(6.297)	(6.352)
$\log(TRA)$	2.528*	2.513*	2.482*
	(3.842)	(3.793)	(3.696)
INF	−7.182*	−7.167*	−7.179*
	(−3.532)	(−3.530)	(−3.533)
$t-4$		1.730	0.368
		(1.489)	(0.450)
$t-3$		1.924*	−1.437*
		(2.178)	(−2.443)
$t-2$		1.515*	−1.511*
		(2.364)	(−2.098)
$t-1$		−0.426	0.184
		(0.610)	(0.167)
t		2.499*	−2.385
		(2.848)	(−1.846)
$t+1$		1.936*	−0.978
		(2.295)	(−1.355)
$t+2$		1.442	−1.002
		(1.586)	(−1.031)
$t+3$		1.025*	−2.168*
		(2.813)	(−2.568)
$t+4$		1.163	−2.409
		(1.219)	(−1.574)
R^2	0.230	0.229	0.230
SSR	43882	43784	43741
Countries		96	
Years		1964–1998	
Country-year observations		2618	

Notes: Effective sample: 1964–1998. The dependent variable is in percentages. We denote significance of the parameters at the 5% confidence level by a *; t-values based on White-consistent estimation are within parentheses. R^2 is the adjusted coefficient of determination. *SSR* denotes the sum of squared residuals and indicates the goodness of fit of the model. Country and time specific fixed effects are not shown.

Olympic Games turn out to have a positive impact on economic growth, while this does not hold for the World Cup. The significance of the event dummy variables drops, though, mainly because the number of observations decreases in the sub-samples. Again, this illustrates that we should interpret the findings in Table 2 with caution. Table 3 shows that for the 1964–1980 sample the current-year (t) impact is significantly positive, while for the 1984–1998 sub-sample the ($t+2$)-impact is positive. For the World Cup we

Table 3. Pooled Estimation Results: Real GDP Per Capita Growth (Sub-samples)

	Olympic Games		World Cup	
Variable	1964–1980	1984–1998	1964–1978	1982–1998
$\log(GDP_{60})$	0.306	−0.127	0.243	−0.248
	(0.886)	(−0.361)	(0.570)	(−0.812)
Δ ($\log(GFC)$)	4.634*	5.902*	3.200*	6.269*
	(2.746)	(4.904)	(2.082)	(5.299)
$\log(TRA)$	3.041*	1.784*	3.133*	2.341*
	(2.348)	(1.314)	(2.071)	(2.100)
INF	−0.238*	−7.013*	−0.238*	−7.213*
	(−4.397)	(−3.430)	(−3.740)	(3.487)
$t-4$	3.308	0.300	0.845	0.387
	(1.452)	(0.353)	(0.450)	(0.561)
$t-3$	1.528	1.740	−1.841	−0.769
	(0.658)	(1.536)	(−1.680)	(−1.048)
$t-2$	1.378	1.417	−0.522	−1.740*
	(0.581)	(1.679)	(−0.445)	(3.240)
$t-1$	−1.937	0.104	−1.175	−0.566
	(−1.021)	(0.107)	(−1.152)	(−1.668)
t	3.321*	1.881	−2.512	−1.415
	(3.708)	(1.551)	(−1.365)	(−1.136)
$t+1$	−0.464	1.744	0.362	−0.565
	(−0.865)	(1.379)	(0.140)	(−1.011)
$t+2$	0.047	2.534*	1.586	−0.378
	(0.056)	(3.056)	(1.419)	(−0.551)
$t+3$	0.549	0.883	−0.073	−1.768
	(0.668)	(0.655)	(−0.061)	(−1.582)
$t+4$	0.881	0.964	−0.782	−3.140
	(0.307)	(1.325)	(−0.779)	(−1.534)
R^2	0.154	0.265	0.128	0.278
SSR	18838	18235	15585	20880
Countries	78	96	76	96
Years	1964–1980	1984–1998	1964–1978	1982–1998
Observations	997	1367	844	1536

Notes: Effective sample: 1964–1998. The dependent variable is in percentages. We denote significance of the parameters at the 5% confidence level by a *; t-values based on White-consistent estimation are within parentheses. R^2 is the adjusted coefficient of determination. *SSR* denotes the sum of squared residuals and indicates the goodness of fit of the model. Country and time specific fixed effects are not shown.

only find a $(t-2)$ negative impact for the 1982–1998 editions. One can see that the growth model produces a better fit in the more recent years.

Both Tables 2 and 3 show that there is a positive contribution in organizing the Summer Olympic Games and a slightly negative impact in organizing the World Cup. It is interesting to note what may explain the differences between the Olympic Games and the World Cup. First of all it

might be that the International Olympic Committee selects higher growth potential economies to organize the Summer Olympic Games than FIFA does for the World Cup, as discussed above. It is clear that the IOC has had more degrees of freedom in selecting the host country than FIFA. Next, it is accepted that the Olympic Games need more investment (due to the large variety of sports), which demands a more careful selection of the hosting city or country. The investment itself also generates growth effects in the years prior to the event, and most likely also afterwards due to improvements in infrastructure. In football, in some cases, the stadiums are available and need only to be renovated. Moreover, access to the stadiums is mostly available, which reduces the investment in infrastructure.

Summary and Conclusions

Organizing major sporting events can boost local economic activity. According to a popular view, investment in infrastructure, a boost in current consumption and an increase in consumer confidence lead to extra growth opportunities. Empirical studies so far do not come to a unified conclusion with respect to the economic impact of major sporting events. Using a post-war growth model we show that a positive impact might hold for the Olympic Games, but not for the FIFA World Cup. Our panel approach is the first in analysing *ex post* the macroeconomic contribution of organizing major sporting events and presents an alternative to event-specific *ex-ante* analyses. We have used simple descriptive statistics for a long time span and a pooled fixed effects model to compare the economic impact of the Summer Games and the World Cup on per capita GDP-growth rates. The growth model suggests that economic growth rates have been higher in those countries that hosted the Olympic Summer Games than in countries that organized the World Cup. These findings suggest caution in claims relating particularly to the economic benefits of staging the World Cup; however we should acknowledge that our approach is too general for individual bidding processes, because individual circumstances will probably be of larger influence to local economic development.

References

Ahlert, G. (2001). The economic effects of the Soccer World Cup 2006 in Germany with regard to different financing. *Economic Systems Research*, *13*(1), 110–118.

Andersen, A. (1999). Economic impact study of the Sydney 2000 Olympic Games. Centre for Regional Economic Analysis Tasmania, Working Paper.

Ashton, J. K., Gerrard, B., & Hudson, R. (2003). Economic impact of national sporting success: The London Stock Exchange. *Applied Economics Letters*, *10*, 783–785.

Baade, R. A., & Matheson, V. A. (2000). An assessment of the economic impact of the American Football Championship, the Super Bowl, on host communities. *Reflets et Perspectives de La Vie Économique*, *39*(2–3), 35–46.

Baade, R. A., & Matheson, V. A. (2001). Home run or wild pitch? Assessing the economic impact of Major League Baseball's All-Star Game. *Journal of Sports Economics*, *2*(4), 307–327.

Baade, R. A., & Matheson, V. A. (2002). Bidding for the Olympics: Fool's Gold? In C. P. Barros, M. Ibrahímo, & S. Szymanski (Eds.), *Transatlantic Sport: The Comparative Economics of North American and European Sports* (pp. 127–151). Cheltenham, UK, and Northampton/MA: Edward Elgar.

Baade, R. A., & Matheson, V. A. (2004a). The quest for the cup: assessing the economic impact of the World Cup. *Regional Studies*, *38* (4), 343–354.

Baade, R. A., & Matheson, V. A. (2004b). Super Bowl or Super (Hyper)Bole: the economic impact of the Super Bowl on host communities. *College of the Holy Cross Working Paper* 04–03.

Barro, R., & Lee, J. W. (1994). Sources of economic growth. *Carnegie-Rochester Conference Series on Public Policy*, *40*, 1–46.

Barro, R., & Sala-I-Martin, X. (1998). *Economic Growth*. Cambridge, MA: MIT Press.

Coates, D., & Humphreys, B. R. (2002). The economic impact of post-season play in professional sports. *Journal of Sports Economics*, *3* (3), 291–299.

Falter, J.-M., Pérignon, C., & Vercruysse, O. (2005). Impact of overwhelming joy on consumer demand: the case of a Soccer World-Cup victory. University of Geneva: Discussion Paper.

Goodman, R. & Stern, R. (1994). Chicago hosts opening game of the World Cup. *Illinois Parks and Recreation*, 25, 3.

Hotchkiss, J. L., Moore, R.E., & Zobey, S. M. (2003). Impact of 1996 Summer Olympic Games on Employment and wages in Georgia. *Southern Economic Journal*, *69* (3), 691–704.

Humphreys, J. M., & Plummer, M. K. (1995). The economic impact on the state of Georgia of hosting the 1996 Olympic Games. Selig Center for Economic Growth. Georgia, Studies and Forecasts.

Kim, H. Y., Gursoy, D., & Lee, S.-B. (2006). The impact of the 2002 World Cup on South Korea: comparisons of pre- and post-Games. *Tourism Management*, *27*, 86–96.

Kim. Y., Rhee, S.-W., Yu, J.-C., Koo, K.-M., & Hong, J.-D. (1989). Impact of the Seoul Olympic Games on Korean economic development, Korea Development Institute, Working Paper 1989–05.

Maddison, A. (2003). *The World Economy: Historical Statistics*. Paris: OECD.

Matheson, V. A. (2005). Contrary evidence on the economic effect of the Super Bowl on the victorious city. *Journal of Sports Economics*, *6* (4), 420–428.

Oldenboom, E (2006). *Cost and Benefits of Major Sports Events*. Amsterdam: MeerWaarde Onderzoeksadvies.

Papanikos, T. (1999). The economic impact of international iourism and the Olympic Games of Athens 2004. Athens Institute of Education and Research, Study Series.

Porter, P. (1999). Mega-sports events as municipal investments: a critique of impact analysis. In J. L. Fizel, E. Gustafson, & L. Hadley (Eds.), *Sports Economics: Current Research*. Westport, CT: Praeger Press.

Preuss, H (2004). *The Economics of Staging the Olympics; A Comparison of the Games 1972–2008*. Cheltenham, UK: Edward Elgar.

Price Waterhouse Coopers (2004). The economic impact of the Olympic Games. *European Economic Outlook*, June, 18–25.

Rahmann, B., & Kurscheidt, M (2002). The Soccer World Cup 2006 in Germany: choosing match locations by applying a modified cost–benefit model. In C. P. Barros, M. Ibrahímo, & S. Szymanski (Eds.), *Transatlantic Sport: The Comparative Economics of North American and European Sports* (pp. 171–203). Cheltenham, UK, and Northampton, MA: Edward Elgar.

Siegfried, J., & Zimbalist, A (2000). The economics of sports facilities and their communities. *The Journal of Economic Perspectives*, *14*, 95–114.

Szymanski, S. (2002). The economic impact of World Cup 2002. *World Economics*, *3* (1), 169–178.